



# THE ART OF RESTORATION

**Fuchs wheels. Instantly recognisable, and immediately synonymous with Porsches and the 911 tradition. We've come to see them being restored at Art Restoration's workshops at Holtzheim in Eastern France**

Words: Johnny Tipler   Photos: Antony Fraser

Few aspects of the 911 encapsulate Porsche's heritage better than the Fuchs wheel. Indeed, there's something very satisfying about a row of individually coloured Fuchs, and that's what forms a focal point in the garage workshop at Art Restoration, located on a light industrial site in rural countryside at Holtzheim near Strasbourg, eastern France. It's the speciality of proprietor Patrick Pugin, and I'm here with my cameraman to see just what the process of renovating Fuchs wheels involves.

There are two strings to Patrick's bow: Art Restoration, the main business, also renovates Porsches, and the Fuchs wheel refurbishment is carried out under the Art Wheels banner. In reality, though, all the work is carried out under the same roof, with dedicated spaces for specific actions to take place on wheels and on cars.

In the depths of the building is a paint booth, and a machine shop with tools and equipment to clean parts and remove rust at high pressure, high temperature and ultrasound, plus small cubicles for grinding and polishing wheel rims. There's an engine and transmission shop which also takes care of carburettors, injection and ignition, and off-site is an acid bath where bodyshells are dunked before being painted black ahead of restoration work. Everything in the yard and the workshop looks spick and span, including the cars – an SC Targa, a 912, a couple of 914s and a 3.2 Carrera.

Patrick set up Art Restoration ten years ago, beginning with the rehabilitation of a 2.2 911E and a 914. 'I wanted to

demonstrate the quality of the work I could achieve, and gradually I started to have more work to do, and now I've got a team of 15 people working here.'

They are concerned solely with air-cooled Porsches, and only street cars: 'we don't have anything to do with racing cars,' says Patrick; 'that avoids many complications, because working on racing cars needs a lot of experience and we are still building our experience on street cars.'

'We go very deep into the heart of our restorations, and we focus on the minutest detail, right down to the correct screw for a particular model year. This is what clients expect, and a lot of cars coming out of the workshop are going straight to shows, exhibitions, concours, so this is why we are so particular about our methods and level of quality.'

As the business took off, Patrick quickly became aware of the need for specialist treatment for Fuchs wheels. 'I tried it myself with reasonable success, but I found a guy in Germany doing just Fuchs wheels and I worked with him one time. He told me he was going to retire, so I bought his knowledge, as well as some machines, and started my own company, Art Wheels, doing only Fuchs restorations.'

Even so, it took Patrick a few goes to perfect the process because his German source hadn't thoroughly explained everything and it took time to refine the technique. Now, Art Wheels currently has three technicians working on the Fuchs alloys.

*Pièce de résistance* to the side of the main workshop and reception area is an eye-catching line-up of Fuchs wheels, all presented in different colours, showcasing Patrick's team's

*Above: Restore your Fuchs wheels? Certainly, sir. What colour would you like? Not every Fuchs wheel is black and bare aluminium...*



*Above: Art Restoration is home to hundreds of Fuchs wheels, some for sale, some belonging to customers. The once unloved Cookie Cutters are gaining in popularity, too*

*Above right: Patrick Pugin shows a mangled RSR wheel – the rim will be cut off and a new one welded on*

*Below left to right: Patrick first checks each wheel for run-out, straightening the rims as necessary; blasting removes all traces of the original paint; huge polishing machine is manually manoeuvred into position against spinning wheel*



handiwork. We pass through into the wheel lab section, and he lifts a Fuchs onto the bench. 'This one has the race finish with the matte black background to the spokes which are themselves shiny. The exterior of the rim is not only polished, it is anodised too.'

Patrick shows how to identify the age of a wheel by the stamping: 'This one is 6in wide by 15in diameter, and it's from June 1969, so it's for a 2.0-litre S, or a 'T' and an 'E'. He explains the process the wheels undergo, depending on the relevant build programme and finish required: 'We have the classic rims for the 2.2 and 2.4, and these are the rims for the 'F' model and 'G' model, and this finish is for an 'S' model, and the RSR model has the much wider rim, of course; they are all nicely differentiated.'

Every wheel passes through a similar treatment process:

'We clean it first, and then check the balance and align it to make sure it is not buckled. If it is crooked we can straighten it, and if there are any cracks that would need some refurbishment.' Some wheels have gone beyond the point of redemption. 'There is a point where a wheel is just so bad that you say, I'm sorry I can't help this one: for example, if

you have one crack in the rim or a spoke we can make a weld, but if there are two we probably don't proceed.

'Sometimes there might be three or four cracks, and in that case, we certainly don't touch it.' He shows us an RSR wheel mangled in

a race accident. It's likely that they'll cut off the rim and weld on a fresh one.

'The black finish is paint; only the bare aluminium parts are anodised. But in the general process we put all the wheels into a bath to make the anodisation after painting.

## “RIM IS NOT ONLY POLISHED, IT IS ANODISED, TOO...”







Anodisation involves a nitric acid bath and an electric current, which causes oxidation of the surface of the metal. You can have coloured anodising, but today we are making the finish like it was originally, trying to be as close as possible to the original finish.

'When the wheels were originally produced it was an industrial process, but today, because we are dealing with them on an individual basis, we can make them better than they were in the past.' The finished wheels look absolutely gorgeous, like confectionery in a sweet shop.

The earliest Fuchs wheels, fitted from 1967 to 1970, are more sensitive to deformation than the version produced from '71; the flatter-dished model is stronger, and Patrick also finds he has fewer balancing problems with the later wheel. 'The design of the wheel has changed, and because it is stronger we have less problems with balancing and geometry. You cannot work on the aesthetics if the wheel is not spinning true.'

The offset between hub spokes and rim is slightly greater on the post-'71 wheels compared with the earlier versions, though probably the earlier wheel is prettier. I spot some ATS Cookie Cutters on a rack. 'Yes, we also handle Cookie Cutter wheels. Five years ago, nobody wanted to know about them,

but today there is lots of interest. For example, in 1974 the 2.4E and S came out the factory with those, and now German owners want to have their car looking original, so Cookie Cutters are back in circulation.' They also refurbish 3.6 Turbo Speedlines and BBS split-rims, which have to be treated in three sections.

'I can show you the process of Fuchs restoration. The first job is the stripping of the wheel; we use a sand-blasting system to remove the paint on the wheel, so now we can check it to see if there are any cracks, and we put it on the balancing machine to check if there is a problem with it twisting.' In which case, the wheel is rotated on a hub and the encircling clamp exerts force on the bucked areas of the rim, effectively straightening it out.

'I have to check the wheel within all dimensions, back and front, and when I know the deformation I can apply pressure in the appropriate direction. It's not easy, but we can do it. We heat the aluminium locally where the problem is, where we want to push on the rim. Sometimes it's due to the geometry of the wheel, so I have to modify the geometry, but sometimes you can have as much as 2mm distortion and that has a big influence on the balancing, so sometimes we take out some metal.'

*Above: Ready for restoration, each wheel is carefully marked, showing size, date and, in this case, whether it's a 'heart' style or not*

*Below left: Some wheels are beyond repair. One crack is generally regarded as the limit. More and the wheel will most likely be rejected*

*Below right: Patrick points to where the Fuchs wheel is date-stamped, in this case showing it's from June 1969*



*Above: Art Restoration is run in parallel to Art Wheels. It is a full-on restoration shop covering all but race cars*

**Contact:**  
Patrick Pugin  
Art Restoration/Art Wheels  
4, rue Joseph Graff  
67810 Holtzheim  
France  
Tel: +33 (0) 981 97 19 92  
patrick.pugin@art-restoration.eu  
www.art-restoration.eu  
www.art-wheels.eu

*Below left and right: Restoration workshop specialises in the early air-cooled cars, notably 911s and 914s. All aspects of restoration can be undertaken*



After stripping, we take out all the major damage and corrosion with the grinding machine, removing metal, and if we need any welding we have to deepen the damaged area by up to 2mm to be sure there is no corrosion. This is the first part of the actual restoration, and we use different types of grinding materials to apply to the metal and remove all the faults.

'The polisher has a very abrasive surface and we start with a very aggressive paste and when there are no more defects we apply thinner and thinner paste to achieve a mirror shine, and after that we make the anodisation. When we weld the metal, we increase the structure of the aluminium, and afterwards when it's all polished to a mirror finish – like chrome – you can't see those repairs.'

The polishing machine is like something you might see in a shoe repair shop with somebody riding a bicycle, using the handlebars to manipulate the polisher head in and around the rim of the rotating wheel. He applies some polish on the disc and you can see it start to brighten up and transform the metal.

'We are polishing 20 wheels a day, so the preparation has to be good; you can spend three hours polishing and still have a bad result if the preparation of the surface is not

good. The anodisation that follows is a chemical process, and the protection it gives the wheel is like the original.' If a wheel is not absolutely perfect after treatment it is declared a 'second choice'. But that's not the end of the road. 'We have a lot of wheels here, and most of them belong to us, so we can sell them, and we make a discount for a wheel with some "clouds" in the anodisation. We cannot say, "it's a perfect wheel," but it could be a spare.'

The final process is applying the colour to the area of the wheel beneath the spokes. This is achieved by dunking the wheel horizontally into a bathtub of paint up to a precise point on the wheel centre, so the spokes remain above the paint surface. 'We lower the wheel into the bath so the paint goes up to just that level, and it's the level of the painting that's making that characteristic pattern that highlights the five spokes. I spent a lot of time developing that process and today I am the only one in Europe doing the paint dipping technique.'

Patrick and his team restore something like 50 wheels a month, and that means that, potentially, another three cars each week are rolling on as-new Fuchs wheels. And let's face it, nothing spruces up a classic 911 better than a set of Fuchs' finest. **CP**

